Investigation of co-Current Rotation at Plasma Edge in the TCABR

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Summaries

This paper summarises experimental results from recent studies on intrinsic co-current rotation at plasma edge in the TCABR tokamak. In tokamaks for ohmic regimes intrinsic counter-current rotation is frequently observed. However in some machines [1-4] co-current rotation is also observed at plasma edge. In the TCABR tokamak an intrinsic toroidal rotation in ohmic discharges shows double shearewith counter-current in the core and co-current rotation at plasma edge. In plasma community there is a definition of intrinsic or spontaneous rotation of the plasma which is the velocity observed without external momentum input or is that which arises with no known external momentum injection. Recent models suggest that momentum might be generated by the turbulence. On the other hand a radial friction force between neutral particles and ions/electrons during the gas injection in the presence of a poloidal component of the magnetic field can accelerate plasma in the toroidal direction. If velocity of neutral particle is much larger than diffusion velocity of ions/electrons the friction force is in radial direction (outward) which produces co-current rotation. In this paper we were investigated the dependence of co-current rotation on gas injection direction. The TCABR results suggest that the intrinsic co-current rotation is substantially less when gas is injected in the both co and counter current directions than what when gas is injected in radial direction.